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Indian Standard

CODE OF PRACTICE FOR MAINTENANCE OF WOOD POLES FOR OVERHEAD POWER AND TELECOMMUNICATION LINES

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CODE OF PRACTICE FOR MAINTENANCE OF WOOD POLES FOR OVERHEAD POWER AND TELECOMMUNICATION LINES

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Indian Standard

CODE OF PRACTICE FOR MAINTENANCE OF WOOD POLES FOR OVERHEAD POWER AND TELECOMMUNICATION LINES

0. F O R E W O R D

0.1 This Indian Standard was adopted by the Indian Standards Institution on 2 December 1972, after the draft finalized by the Timber Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Wood poles for overhead power and telecommunication lines are covered in IS : 876-1970*. In order to acquaint the user about the behaviour pattern of a natural product like wood poles, it is necessary that some guideline in regard to the maintenance of wood are laid down so that satisfactory economic service life may be obtained. With this consideration the Sectional Committee has prepared this standard.

0.3 Wood poles in service are most vulnerable at the ground level where attack by fungus and insects is maximum. Growth of fungus or attack of insects may commence at this point and then proceed upwards and downwards. The pole tops also become vulnerable to fungus and soft rot attack owing to leaching of natural preservatives in some timbers due to rains.

0.4 It is, therefore, necessary that the wood pole as a whole is well protected and maintained against insect attack and decay specially at the ground level. For this, periodic inspection and use of suitable remedial treatments are recommended in this standard. Further, preservative treatments may be necessary even in treated poles since in some cases the toxicity of a preservative may go down slowly with the passage of time.

0.5 In case of butts, which are completely decayed the same have to be replaced by new stubs which help to increase the life of wood pole and provisions have also been made in this standard.

0.6 Assistance has been rendered by Forest Research Institute and Colleges, Dehra Dun, in the preparation of this standard.

*Specification for wood poles for overhead power and telecommunication lines (*second revision*).

0.7 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS:2-1960*. The number of significant places retained in the rounded off value, should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the maintenance requirements of wood poles in service for overhead power and telecommunication lines, both treated (*see* IS:876-1970†) and sapwood free untreated poles belonging to naturally durable species (*see* Appendix A of IS:876-1970†) including the following aspects:

- a) Inspection and report,
- b) Remedial treatment for biological damages, and
- c) Remedial treatment for mechanical damages.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions and terms given in IS:707-1968‡ shall apply.

3. INSPECTION

3.1 Types of inspection shall be as follows:

- a) *Routine Inspection* — It shall consist of removing the soil round the pole to a depth of 7.5 to 15 cm below ground level and to a width of 10 to 15 cm around the pole. A pole shall then be sounded with a hammer all round from the bottom of the excavation to as far up the pole as can be reached. Any softening of the wood noticed is indicative of rot and the depth of the rot at any spot, if required, may be ascertained with an increment borer.
- b) *Detailed Inspection* — It shall consist of removing the soil around the pole to a depth of 40 to 60 cm below ground level and to a width of 25 cm. The entire surface of the pole (as far as possible) shall be sounded with a light hammer to ascertain any softening of the wood particularly near cracks, knots, bolt holes, etc. If required, the depth of the rot shall be ascertained with the help of an increment borer. Any holes created by borer shall be immediately plugged by treated wood dowels.

*Rules for rounding off numerical values (*revised*).

†Specification for wood poles for overhead power and telecommunication lines (*second revision*).

‡Glossary of terms applicable to timber and timber products (*first revision*).

3.2 Periodicity of Inspection — After the installation of poles, routine and detailed inspection shall be carried out at the following intervals:

- a) Routine inspection shall be carried out after every three years till twelfth year and thereafter, every two years.
- b) Detailed inspection shall be carried out after every six years up to twelfth year and thereafter, every four years.

3.2.1 No routine inspection need be carried out when the detailed inspection is due.

4. REPORT

4.1 After inspection, a comprehensive report shall be prepared in the form as given in Appendix A which shall be retained as long as the pole is in use.

5. REMEDIAL TREATMENT FOR BIOLOGICAL DAMAGE

5.1 The remedial treatment shall be carried out only of those poles which are not recommended to be rejected by the inspection party for excessive rot, insect attack, or mechanical damage. The remedial treatment shall be given as in 5.1.1.

5.1.1 This treatment shall be given according to requirements when fungus growth and/or insect attack is noticed on the pole surface on inspection or when the initial treatment is not considered sufficiently resistant. The decayed portion shall be scrapped off with a sharp knife.

5.1.1.1 The recommended preservatives for treatment are given in Table 1. For details of composition and method of preparation of preservative, reference may be made to IS : 401-1967*.

**TABLE 1 RECOMMENDED PRESERVATIVES FOR
GROUND LINE TREATMENT**

SL No.	NAME OF PRESERVATIVE	CONDITION OF PRESERVATIVE
i)	Coal tar creosote	Applied hot
ii)	Copper-chrome-arsenic	Paste for injection/surface application
iii)	Acid-copper-chrome composition	do
iv)	Copper-chrome-boric acid composition	do

*Code of practice for preservative of timber (*second revision*).

5.1.1.2 The soil around the pole shall be removed to a depth of 45 to 60 cm and to a width of 25 cm. The treatment should preferably be given in summer when the pole is dry. The soil is loosely filled to depth of 30 cm and about half gallon of hot creosote is poured evenly around the circumference of the pole about 25 cm above the ground line. The coated surface is covered around with a polyethylene wrapper film with a paper masking tape. The earth around the pole is then consolidated to the original level.

5.1.1.3 The paste of the preservative mentioned in Table 1 shall be injected into the pole with the help of an injection tool worked manually. This shall be carried out from 30 to 40 cm, below ground to 45 cm above ground level; injections shall be done at interval of 10 to 12 cm vertically and horizontally and about 4 to 5 cm deep. Each pole shall get 80 to 120 injections. Treated surface shall be coated with hot tar and the earth shall be back filled and consolidated.

5.1.1.4 Six centimetres bandage coated inside with paste of water-borne preservatives (*see* Table 1) shall be tightly wrapped around the pole 30 to 40 cm below ground line and 25 cm above ground line. The bandage shall then be covered with a polyethylene cover to protect from outside water. The earth shall be back filled.

5.1.1.5 In the absence of any internal decay, the attacked portion from the surface shall be scrapped and the surface shall be charred with a blow torch. This shall be followed by liberal brushing of hot creosote oil. After few days the earth shall be back filled.

5.1.1.6 Pole-top-treatment — Any soft portion or rot noticed at the time of inspection shall be scrapped off. The top three metres of the pole or portion below three metres where inspection has confirmed any rot, shall be brush coated with a 5 percent solution of pentachlorophenol in a petroleum solvent. Any pole scooped out at the top shall be filled with a paste made of 5 percent solution of pentachlorophenol and fly ash and suitably covered.

5.1.1.7 For obtaining satisfactory service life all poles may be given two liberal brush coats of hot creosote or 5 percent solution of pentachlorophenol in a petroleum solvent from top to a depth of 40 to 60 cm below ground level. Such treatments may be given initially after 12 years of installation and thereafter, along with every detailed inspection. Care should be taken to see that the preservative solution penetrates the holes, crevices, etc, completely.

6. REMEDIAL TREATMENT FOR MECHANICAL DAMAGES

6.1 Suitable mechanical clamps shall be fixed on poles whenever it is felt that the initial defects are on the increase.

6.2 When the lower portion of the pole is excessively damaged compared to the upper portion, the same shall be replaced by a new stub.

6.2.1 The stub shall be as far as possible of the same species or at least of the same or higher group of the original pole (*see* IS : 6056 - 1970*).

6.2.2 Length of the stub shall be between 2.4 to 6.4 m so as to provide a joint, one-third centre of the pole, above the ground line.

6.2.3 Ground line circumference of the stub shall not be less than that of the replaced butt. The sections to be jointed shall have approximately the same girth at the joint.

6.2.4 Stub shall be treated with a preservative treatment in accordance with IS : 401-1967†.

6.2.5 Stub shall be jointed to the upper portion with a wire bound lap joint in accordance with 11.1 of IS : 6056 - 1970*.

6.2.6 Soil shall then be back filled and solidly rammed round the stub.

6.2.7 Joint shall be inspected for any looseness after a period of six months.

6.3 A pole shall be replaced by a treated solid or jointed wood pole when the damage due to decay or development of defects is beyond the safe limit or when any permissible defect extends to 2.5 times its original dimensions. The new pole shall be erected with a distance of 1 m from the position of the original pole.

*Specification for jointed wood poles for overhead power and telecommunication lines.

†Code of practice for preservative of timber (*second revision*).

APPENDIX A*(Clause 4.1)***INSPECTION REPORT**

- i) Locality of installation_____
- ii) Pole No. _____
- iii) Species _____
- iv) Supplier (origin) _____
- v) Preservative treatment given _____
- vi) Absorption of the preservative _____
- vii) Treatment process _____
- viii) Dimension of the pole at the time of installation _____
- ix) Total length _____
- x) Diameter at ground level _____
- xi) Top diameter _____
- xii) Initial defects and their position at the time of installation,
if any _____
- xiii) Date of installation _____
- xiv) Date of inspection _____
- xv) Type of inspection (routine or detailed) _____
- xvi) Cracks _____
- xvii) Biological attack (see legend) }
 - Above ground level
 - Below ground level
- xviii) Diameter at ground level _____
- xix) Other observations _____
- xx) Initials of Inspector _____
- xxi) Remedial measures recommended _____
- xxii) Remedial measures carried out or not _____

LEGEND FOR BIOLOGICAL ATTACK AT A PARTICULAR SPOT

N	—	No attack	
Sw	—	Slight termite attack	} 5 to 10 percent attack
Sf	—	Slight fungus attack	
Mw	—	Moderate termite attack	} 10 to 25 percent attack
Mf	—	Moderate fungus attack	
Bw	—	Bad termite attack	} 25 to 50 percent attack
Bf	—	Bad fungus attack	
Dw	—	Destroyed by termites	} Above 50 percent attack
Df	—	Destroyed by fungus	
R	—	Recommended for immediate rejection and replacement	

**INDIAN STANDARDS
ON
WOOD POLES**

IS:

- 876-1970 Wood poles for overhead power and telecommunication lines (*second revision*)
- 2203-1962 Wooden cross arms
- 5978-1970 Code of practice for design for wood poles for overhead power and telecommunication lines
- 6056-1970 Jointed wood poles for overhead power and telecommunication lines

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